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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,852	12/08/2003	James Christopher Matayabas JR.	42P17180	4439

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EXAMINER

GEYER, SCOTT B

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,852

Applicant(s)

MATAYABAS, JAMES
CHRISTOPHER

Examiner

Scott B. Geyer

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 15-23 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-14 is/are allowed.
- 6) ☒ Claim(s) 1 and 11 is/are rejected.
- 7) ☐ Claim(s) 2-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-14, drawn to a method of making an encapsulated microelectronic device, classified in class 438, subclass 127.
- II. Claims 15-23, drawn to an epoxy with a catalyst compound, classified in class 528, subclass 1+.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the epoxy with a catalyst compound can be used for another process such as an adhesive for joining two materials together.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Steven De Klerk on March 18th, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-14. Affirmation of this election must be made by applicant in replying to this Office action. Claims 15-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

The drawings as submitted on December 8th, 2003 appear to be hand-drawn informal drawings, which are acceptable for examination purposes. Upon allowance of the instant application, more concise and clear drawings will be required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crowley et al. (6,309,916 B1) in view of Inagaki et al. (5,610,443).

As to claim 1, Crowley et al. teach a method of molding an epoxy resin over a die (microelectronic assembly), as shown in figures 3 and 5. The die 20 is attached to a substrate 30, the package is positioned within a mold having upper and lower plates 46 and 48, wherein the upper plate 46 is located over the die 20 and substrate 30. An

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encapsulant mixture is injected through ram 56 and flows over the die into the cavity 42 defined by the substrate 30, the die 20 and the upper mold 46. The epoxy resin that is injected is in liquid phase, having been melted prior to entry into the mold cavity (see column 4, lines 40-50). Crowley et al. do not teach a solid phase catalyst compound used in the epoxy encapsulant, nor do Crowley et al. teach the catalyst compound becoming a liquid and curing the epoxy. However, Inagaki et al. disclose a prior art method of using a solid catalyst mixed with a liquid epoxy resin, wherein the solid catalyst becomes a liquid (i.e. is dissolved) when the liquid epoxy resin is heated, which subsequently cures the epoxy resin (see column 1, lines 61-67, continued to column 2, lines 1-5). Therefore, it would have been obvious to a person of ordinary skill in the art to modify the method of Crowley et al. with a solid curing catalyst for a heated epoxy resin as taught by Inagaki et al. so as to quicken the curing process of the epoxy resin encapsulant and increase manufacturing efficiency.

As to claim 11, Crowley et al. teach removing the epoxy (and the molded device within the epoxy) from the mold piece after the epoxy is cured (column 4, lines 51 et seq.).

Allowable Subject Matter

Claims 2, 5, 7 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record and to

the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding:

the catalyst compound including a polymer and the catalyst bound to the polymer, as recited in claim 2 (*claims 3 and 4 are dependent upon claim 2*);

the catalyst compound is less active than triphenyl phosphine of the same mass fraction at 120°C as recited in claim 5 (*claim 6 is dependent upon claim 5*);

the epoxy is at least one of bis(4-glycidyloxyphenyl)methane, poly[(o-cresyl glycidyl ether)-co-formaldehyde], 4,4'-isopropylidenediphenol diglycidyl ether or 3,5,3',5'-tetramethyldiphenyl 4,4'-diglycidyl ether, as recited in claim 7;

wherein the epoxy is a liquid at 22°C as recited in claim 8 (*claims 9 and 10 are dependent on claim 8*).

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Claims 12-14 are allowed.


The following is a statement of reasons for the indication of allowable subject matter. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a method of making a microelectronic assembly wherein an encapsulant mixture is used to encapsulate a microelectronic die, such that the encapsulant mixture is made of a liquid phase epoxy and a solid phase polystyrene-bound diphenyl phosphine catalyst compound, as recited in claim 12 (*claims 13 and 14 are dependent upon claim 12*).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott B. Geyer whose telephone number is (571) 272-1958. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



3/18/05

Scott B. Geyer
Patent Examiner, 2812
March 18, 2005